

Attorney Docket No. P13286-US2

REMARKS/ARGUMENTS**1.) Claim Amendments**

The Applicants have amended claims 4, 20, and 29; claims 1-3, 11-12, 16-19, and 25-27 were previously canceled; and claims 32-39 have been added herein. Accordingly, claims 4-10, 13-15, 20-24, and 28-39 are pending in the application. Favorable reconsideration of the application is respectfully requested in view of the foregoing amendments and the following remarks.

2.) Allowable Subject Matter

The Applicants gratefully acknowledge the allowance of claims 30 and 31.

3.) Claim Rejections – 35 U.S.C. § 103(a)

In paragraphs 2-3 of the Office Action, the Examiner rejected claims 4, 7-8, 10, 13-14, 20, 28 and 29 under 35 U.S.C. § 103(a) as being unpatentable over Ishikawa (US 6,600,835). The Applicants respectfully disagree. Claims 4, 20, and 29 have been amended to clarify the claimed invention. The Examiner's reconsideration of the application is respectfully requested.

Regarding claims 4, 13, and 14, the Examiner points to FIGS. 1-2 and columns 9-10 of Ishikawa for showing the claimed invention except for identifying a frame as redundant if the motion estimation yields a final correlation coefficient above a predetermined threshold. The Examiner concludes that this step would be obvious to a person skilled in the art. The Applicants disagree with the Examiner's assessment of Ishikawa.

Ishikawa discloses a compression-encoding method for video frames that determines whether a predetermined number of frames have been received prior to starting the compression-encoding process. If some of the received frames in a predefined group of pictures (GOP) have been dropped, the method recognizes this from the frame numbers and processes a reduced number of frames. (Col. 3, lines 38-43). There is no teaching or suggestion of a system or method that intentionally drops selected frames, as claimed by the Applicants.

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The Examiner noted that Ishikawa states that frames that are identical to a preceding reference frame are not compression-encoded. (Col. 10, lines 46-48). Instead, the variable length encoder produces a header indicating that the frame is identical to the reference frame, and stores it in memory. (Col. 10, lines 30-36 and 43-52). However, the discussion in columns 9-10 of Ishikawa must be predicated by an understanding of FIG. 4. The dotted parallelograms in FIG. 4 represent video frames that were missing (dropped) when the sequence was received, while the solid parallelograms represent frames that were successfully received. Therefore, frames 1, 2, 4, 7, and 9 were successfully received, while frames 3, 5, 6, and 8 were unintentionally dropped prior to reaching the preprocessor. Ishikawa fills in the dropped frames *by copying the preceding [reference] frames of data*. (Col. 10, lines 43-45). This provides the required number of frames so that processing of the group of pictures (GOP) can begin at a designated time, without having to wait for the arrival of additional frames to fill in for the dropped frames. Thus, Ishikawa is not deleting received video frames, but is merely not compressing frames that the preprocessor copied to fill in the required number of frames in the sequence.

This is an entirely different process than the claimed invention, and Ishikawa achieves a different result for a different purpose. The claimed invention analyzes correctly received frames, and selectively deletes frames to produce a decimated frame set for further processing. In claims 4, 13, and 14, the method selects a frame for deletion by determining a motion estimation between the frames in the video sequence, and selecting a frame for deletion if the motion estimation yields a final correlation coefficient above a predetermined threshold. Thus, if there is very little difference between frames, some frames are selected and deleted. This reduces processing requirements while maintaining the quality of the video stream. This process of deleting received frames is not taught or suggested by Ishikawa. Therefore, the withdrawal of the § 103 rejection and the allowance of claims 4, 13, and 14 are respectfully requested.

Claims 7, 8, and 10 depend from claim 4 and recite further limitations in combination with the novel and unobvious elements of claim 4. Therefore, the allowance of claims 7, 8, and 10 is respectfully requested.

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Claim 20 has been amended to recite a system for preprocessing a video sequence to produce a set of views suitable for Structure from Motion processing. The system includes a source for a sequence of video frames; a storage medium; and a preprocessor connected to the source and the storage medium. The preprocessor includes means for selecting a frame from the sequence to be intentionally deleted, and means for deleting the selected frame. Once again, the process of intentionally deleting received frames, to reduce the size of the frame sequence, is not taught or suggested by Ishikawa. Therefore, the withdrawal of the § 103 rejection and the allowance of amended claim 20 are respectfully requested.

Claim 28 depends from claim 20 and recites further limitations in combination with the novel and unobvious elements of claim 20. Therefore, the allowance of claim 28 is respectfully requested.

Claim 29 has been amended to recite a preprocessor for preprocessing a received sequence of video frames and storing a decimated subset of frames suitable for Structure from Motion processing. The preprocessor includes means for determining a motion estimation between the frames in the video sequence; means for selecting a frame from the sequence to be intentionally deleted if the motion estimation for the frame and an adjacent frame yields a final correlation coefficient above a predetermined threshold; and means for deleting the selected frame. Once again, means for intentionally deleting received frames, to reduce the size of the frame sequence, is not taught or suggested by Ishikawa. Therefore, the withdrawal of the § 103 rejection and the allowance of amended claim 29 are respectfully requested.

In paragraph 12 of the Office Action, the Examiner rejected claims 5-6 under 35 U.S.C. § 103(a) as being unpatentable over Ishikawa in view of Lee, et al. (US 6,400,831). However, as noted above, Ishikawa fails to teach or suggest the process of deleting received frames, as recited in base claim 4. Lee was cited for disclosing global and local motion estimation. However, Lee also fails to teach or suggest the process of deleting received frames, as recited in base claim 4. Claims 5 and 6 depend from claim 4 and recite further limitations in combination with the novel elements of claim 4. Therefore, the allowance of claims 5-6 is respectfully requested.

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In paragraph 16 of the Office Action, the Examiner rejected claim 9 under 35 U.S.C. § 103(a) as being unpatentable over Ishikawa in view of Ratakonda (US 5,995,095). However, as noted above, Ishikawa fails to teach or suggest the process of deleting received frames, as recited in base claim 4. Ratakonda was cited for inherently disclosing determining shot boundaries by correlating adjacent frames after global motion compensation, and identifying the second frame in each pair of frames as the beginning of a new shot. However, like Ishikawa, Ratakonda also fails to teach or suggest the process of deleting received frames, as recited in base claim 4. Claim 9 depends from claim 4 and recites further limitations in combination with the novel elements of claim 4. Therefore, the allowance of claim 9 is respectfully requested.

In paragraph 20 of the Office Action, the Examiner rejected claim 15 under 35 U.S.C. § 103(a) as being unpatentable over Ishikawa in view of the Goodman article "Ready for action: five video-capture boards that bring motion video to your PC" (Goodman). However, as noted above, Ishikawa fails to teach or suggest the process of deleting received frames, as recited in base claim 13. Goodman was cited for disclosing monitoring the rate at which accepted frames are provided to the storage device, and providing an indication to the user of the video capture device to decrease the motion of the camera, if the storage device is unable to process the accepted frames at the current rate. However, like Ishikawa, Goodman also fails to teach or suggest the process of deleting received frames, as recited in base claim 13. Claim 15 depends from claim 13 and recites further limitations in combination with the novel elements of claim 13. Therefore, the allowance of claim 15 is respectfully requested.

In paragraph 24 of the Office Action, the Examiner rejected claims 21-23 under 35 U.S.C. § 103(a) as being unpatentable over Ishikawa in view of Wang (US 6,707,852). However, as noted above, Ishikawa fails to teach or suggest the process of deleting received frames, as recited in amended base claim 20. Wang was cited for disclosing a data buffer in the preprocessor, and the Examiner contends the remaining limitations are disclosed by Ishikawa. However, like Ishikawa, Wang also fails to teach or suggest the process of deleting received frames, as recited in base claim 20. Claims 21-23 depend from claim 20 and recite further limitations in

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combination with the novel elements of claim 20. Therefore, the allowance of claims 21-23 is respectfully requested.

In paragraph 30 of the Office Action, the Examiner rejected claim 24 under 35 U.S.C. § 103(a) as being unpatentable over Ishikawa in view of Wikipedia, the Free Encyclopedia ("Wikipedia"). However, as noted above, Ishikawa fails to teach or suggest the process of deleting received frames, as recited in amended base claim 20. Wikipedia was cited for disclosing a flash memory device. However, like Ishikawa, Wikipedia also fails to teach or suggest the process of deleting received frames, as recited in base claim 20. Claim 24 depends from claim 20 and recites further limitations in combination with the novel elements of claim 20. Therefore, the allowance of claim 24 is respectfully requested.

4.) New Claims

New independent claim 32 recites a method of preprocessing a sequence of video frames to produce a decimated subset of frames prior to further processing. The method includes the steps of receiving the sequence of video frames; selecting a frame from the sequence to be intentionally deleted; and deleting the selected frame. As noted above, none of the cited references teach or suggest a method in which a received frame is selected from the sequence to be intentionally deleted to produce a decimated subset of frames. Therefore, the allowance of new claim 32 is respectfully requested.

New claims 33-35 depend from claim 32 and recite further limitations in combination with the novel and unobvious elements of claim 32. Therefore, the allowance of claims 33-35 is respectfully requested.

New claims 36-37 depend from claim 20 and recite further limitations in combination with the novel and unobvious elements of claim 20, as discussed above. Therefore, the allowance of claims 36-37 is respectfully requested.

New claims 38-39 depend from claim 29 and recite further limitations in combination with the novel and unobvious elements of claim 29, as discussed above. Therefore, the allowance of claims 38-39 is respectfully requested.

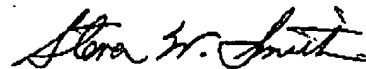
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CONCLUSION

In view of the foregoing remarks, the Applicants believe all of the claims currently pending in the Application to be in a condition for allowance. The Applicants, therefore, respectfully request that the Examiner withdraw all rejections and issue a Notice of Allowance for claims 4-10, 13-15, 20-24, and 28-39.

The Applicants request a telephonic interview if the Examiner has any questions or requires any additional information that would further or expedite the prosecution of the Application.

Respectfully submitted,



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